

**Electrical Level 3
2022-2023
Course Syllabus**

WEEKS 1 – 12

Mike Holt’s Understanding the NEC 2020 – Volume 1 (UNEC1)
Mike Holt’s Understanding the NEC 2020 – Workbook (UNECWB)
Mike Holt’s Understanding the NEC 2020 – Volume 2 (UNEC2)
Mike Holt’s Basic Motor Controls (BMC)
Mike Holt’s Understanding NEC Requirements for Bonding and Grounding NEC 2020 (BG)
2020 National Electric Code (NEC)

WEEK	CONTENT	MATERIALS USED	ASSIGNMENT(S) <i>Numbers listed next to assignment reflect the number of questions.</i>
	Orientation/Introduction of Program Apprenticeship Application (VDOL)	Canvas VDOL Outreach	CANVAS MODULE: 21-22 APPRENTICESHIP ORIENTATION
	Review E2 Material	UNEC1 (Articles 400-404) NEC UNECWB	UNECWB ARTICLE 400: FLEXIBLE CORDS & FLEXIBLE CABLES(11) UNECWB ARTICLE 402: FIXTURE WIRES (4) UNECWB ARTICLE 404: SWITCHES (25)
	Receptacles, Cord Connectors, & Attachment Plugs (Caps)	UNEC1 (Article 406) NEC	UNECWB ARTICLE 406: RECEPTACLES, ATTACHMENT PLUGS, & CORD CONNECTORS (44)
	Switchboards, Switchgear, and Panelboards	UNEC1 (Article 408) NEC	UNECWB ARTICLE 408: SWITCHBOARDS & PANELBOARDS (22)
	Luminaires, Lampholders, and Lamps	UNEC1 (Article 410) NEC	UNECWB ARTICLE 410: LUMINAIRES, LAMPHOLDERS, & LAMPS (43)
	Low Voltage Lighting	UNEC1 (Article 411) NEC	UNECWB ARTICLE 411: LOW-VOLTAGE LIGHTING (6)
	Appliances	UNEC1 (Article 422) NEC	UNECWB ARTICLE 422: APPLIANCES (32)
	Fixed Electric Space-Heating Equipment	UNEC1 (Article 424) NEC	UNECWB ARTICLE 424: FIXED ELECTRICAL SPACE-HEATING EQUIPMENT (7)
	Air-Conditioning & Refrigerating Equipment	UNEC1 (Article 440) NEC	UNECWB ARTICLE 440: AIR CONDITIONING & REFRIGERATION EQUIPMENT (6)
	Generators	UNEC1 (Article 445)	UNECWB ARTICLE 445: GENERATORS (7)

		NEC	
	Transformers and Transformer Vaults (including secondary ties)	UNEC1 (Article 450) NEC	UNECWB ARTICLE 450: TRANSFORMERS (5)
	Capacitors	NEC (Article 460)	
	Chapter 4 (Articles 400-460) Review	UNEC 1 (Articles 400-460) NEC	UNEC1 CHAPTER 4: PRACTICE QUESTIONS (50)
	Special Occupancies & Hazardous Locations	UNEC2 (Articles 500-547) NEC	UNEC2 CHAPTER 5: ARTICLE 500 HAZARDOUS LOCATIONS (17) UNEC2 CHAPTER 5: ARTICLE 501 CLASS I HAZARDOUS LOCATIONS (51) UNEC2 CHAPTER 5: ARTICLE 502 CLASS II HAZARDOUS LOCATIONS (22) UNEC2 CHAPTER 5: ARTICLE 503 CLASS III HAZARDOUS LOCATIONS (13) UNEC2 CHAPTER 5: ARTICLE 547 AGRICULTURAL BUILDINGS (12)
	Grounding and Bonding	UNEC1 (Articles 250.1-250.12) NEC BG	UNECWB ARTICLE 250: GENERAL (16)
	System Grounding	UNEC1 (Articles 250.20-250.36) NEC BG	UNECWB ARTILCE 250: SYSTEM GROUNDING (46)
	Grounding Electrode System Grounding Electrode Conductor	UNEC1 (Articles 250.50-250.70) NEC BG	UNECWB ARTICLE 250: GROUNDING ELECTRODE SYSTEM AND GROUNDING ELECTRODE CONDUCTOR (63)
	Enclosure, Raceway, and Service Cable Connections	UNEC1 (Article 250.80 & 250.86) NEC BG	UNECWB ARTICLE 250: ENCLOSURE, RACEWAY, AND SERVICE CABLE CONNECTIONS (37)
	Bonding	UNEC1 (Article 250.90-250.106) NEC BG	
	Equipment Grounding & Equipment Grounding Conductors	UNEC1 (Articles 250.110-250.126) NEC BG	UNECWB ARTICLE 250: EQUIPMENT GROUNDING AND EQUIPMENT GROUNDING CONDUCTORS (25)
	Methods of Equipment Grounding	UNEC1 (Articles 250.130-250.148) NEC BG	UNECWB ARTICLE 250: METHODS OF EQUIPMENT GROUNDING (14)
	Midterm Exam Review	UNEC1 (Articles 250-547) NEC BG	REVIEW ALL PREVIOUS ASSIGNMENTS

Midterm Exam	Standardized Exam Reviewing Weeks 1-12 Material Covered	CANVAS EXAM (3.5 HOURS TO COMPLETE – 1 ATTEMPT)
--------------	------------------------------------------------------------	-------------------------------------------------

WEEKS 13-24

Mike Holt's Understanding the NEC 2020 – Volume 1 (UNEC1)
Mike Holt's Understanding the NEC 2020 – Workbook (UNECWB)
Mike Holt's Understanding the NEC 2020 – Volume 2 (UNEC2)

Mike Holt's Basic Motor Controls (BMC)

Mike Holt's Understanding NEC Requirements for Bonding and Grounding NEC 2020 (BG)
2020 National Electric Code (NEC)

WEEK	CONTENT	MATERIALS USED	ASSIGNMENT(S)
	Introduction to Motor Controls	UNEC1 (Article 430) NEC BMC (Chapter 1)	UNECWB ARTICLE 430: MOTORS, MOTOR CIRCUITS, AND CONTROLLERS (33) BMC CHAPTER 1: UNIT 1 BASIC PRINCIPLES OF MOTOR CONTROLS (9) BMC CHAPTER 1: UNIT 2 DEFINITIONS, ABBREVIATIONS, AND SYMBOLS (10) BMC CHAPTER 1: UNIT 3 COMMON CONTROL EQUIPMENT, DEVICES, AND SYMBOLS (20)
	Motor Controls and schematics	UNEC1 (Article 430) NEC BMC (Chapter 2)	BMC CHAPTER 2: UNIT 4 COMPONENTS OF CONTROL CIRCUIT SCHEMATICS (13) BMC CHAPTER 2: UNIT 5 MAGNETIC CONTROL (19) BMC CHAPTER 2: UNIT 6 MAGNETIC MOTOR STARTERS (19) BMC CHAPTER 2: UNIT 7 BASIC CONTROL CIRCUITS (24) BMC CHAPTER 2: UNIT 8 OVERCURRENT PROTECTION FOR CONTROL CIRCUITS (12) BMC CHAPTER 2: UNIT 9 INDICATOR (PILOT) LIGHTS & ILLUMINATED PUSHBUTTONS (20) BMC CHAPTER 2: UNIT 10 SELECTOR SWITCHES & TRUTH TABLES (12)
	Reversing Controls	UNEC1 (Article 430) NEC BMC (Chapter 3)	BMC CHAPTER 3: UNIT 11 REVERSING CONTROLS FOR THREE-PHASE MOTORS (22) BMC CHAPTER 3: UNIT 12 REVERSING CONTROLS WITH INDICATOR (PILOT) LIGHTS FOR THREE-PHASE MOTORS (9) BMC CHAPTER 3: UNIT 13 REVERSING CONTROLS WITH LIMIT SWITCHES FOR THREE-PHASE MOTORS (17) BMC CHAPTER 3: UNIT 14 REVERSING SINGLE-PHASE MOTORS (15)
	Controls for Multiple Motors	UNEC1 (Article 430) NEC BMC (Chapter 4)	BMC CHAPTER 4: UNIT 15 SEQUENCING CONTROL (21) BMC CHAPTER 4: UNIT 16 MASTER STOP FUNCTION (6)

	Miscellaneous Requirements	<p>UNEC1 (Article 430) NEC BMC (Annex A)</p>	<p>BMC ANNEX A: UNIT 17 MOTOR AND CONTROLLER DISCONNECTING MEANS IN SCHEMATICS (10) BMC ANNEX A: UNIT 18 MISCELLANEOUS MOTOR CONTROL CIRCUITS (10) BMC ANNEX A: UNIT 19 MOTOR WINDING CONNECTIONS (18) BMC ANNEX A: UNIT 20 MISCELLANEOUS CONTROL AND SIGNALING CIRCUITS (10)</p>
	Motors, Motor Circuits & Controllers	<p>UNEC1 (Article 430) NEC BMC (Annex B)</p>	<p>BMC ANNEX B: 430 PRACTICE QUESTIONS (39)</p>
	Special Occupancies	<p>UNEC2 (Articles 550-590) NEC</p>	<p>UNEC2 CHAPTER 5: ARTICLE 550 MOBILE HOMES, MANUFACTURED HOMES, AND MOBILE HOME PARKS (9) UNEC2 CHAPTER 5: ARTICLE 555 MARINAS, BOATYARDS, AND DOCKING FACILITIES (34) UNEC2 CHAPTER 5: ARTICLE 590 TEMPORARY INSTALLATIONS (24)</p>
	Special Equipment	<p>UNEC2 (Chapter 6) NEC</p>	<p>UNEC2 CHAPTER 6: ARTICLE 600 ELECTRIC SIGNAS AND OUTLINE LIGHTING (31) UNEC2 CHAPTER 6: ARTICLE 604 MANUFACTURED WIRING SYSTEMS (3) UNEC2 CHAPTER 6: ARTICLE 620 ELEVATORS, ESCALATORS, AND MOVING WALKS (14) UNEC2 CHAPTER 6: ARTICLE 625 ELECTRIC VEHICLE POWER TRANSFER SYSTEM (13) UNEC2 CHAPTER 6: ARTICLE 630 ELECTRIC WELDERS (10) UNEC2 CHAPTER 6: ARTICLE 640 AUDIO SIGNAL AMPLIFICATION AND REPRODUCTION EQUIPMENT (10) UNEC2 CHAPTER 6: ARTICLE 645 INFORMATION TECHNOLOGY EQUIPMENT (ITE) (25) UNEC2 CHAPTER 6: ARTICLE 680 SWIMMING POOLS, SPAS, HOT TUBS, FOUNTAINS, AND SIMILAR INSTALLATIONS (40) UNEC2 CHAPTER 6: ARTICLE 690 SOLAR PHOTOVOLTAIC (PV) SYSTEMS (45) UNEC2 CHAPTER 6: ARTICLE 691 LARGE-SCALE PHOTOVOLTAIC (PV) ELECTRIC SUPPLY STATIONS (5) UNEC2 CHAPTER 6: ARTICLE 695 FIRE PUMPS (13)</p>
	Special Conditions	<p>UNEC2 (Chapter 7) NEC</p>	<p>UNEC2 CHAPTER 7: ARTICLE 700 EMERGENCY SYSTEMS (30) UNEC2 CHAPTER 7: ARTICLE 701 LEGALLY REQUIRED STANDBY SYSTEMS (17)</p>

			UNEC2 CHAPTER 7: ARTICLE 702 OPTIONAL STANDBY SYSTEMS (17) UNEC2 CHAPTER 7: ARTICLE 705 INTERCONNECTED ELECTRIC POWER PRODUCTION SOURCES (34) UNEC2 CHAPTER 7:ARTICLE 706 ENERGY STORAGE SYSTEMS (4) UNEC2 CHAPTER 7: ARTICLE 710 STAND-ALONE SYSTEMS (12) UNEC2 CHAPTER 7: ARTICLE 725 REMOTE CONTROL, SIGNALING, AND POWER LIMITED CIRCUITS (46) UNEC2 CHAPTER 7: ARTICLE 760 FIRE ALARM SYSTEMS (30) UNEC2 CHAPTER 7: ARTICLE 770 OPTICAL FIBER CABLES (11)
	Communications Systems	UNEC2 (Chapter 8) NEC	UNEC2 CHAPTER 8: ARTICLE 800 GENERAL REQUIREMENTS FOR COMMUNICATIONS SYSTEMS (31) UNEC2 CHAPTER 7: ARTICLE 805 GENERAL REQUIREMENTS FOR COMMUNICATIONS CIRCUITS (16) UNEC2 CHAPTER 7: ARTICLE 820 COMMUNITY ANTENNA TELEVISION (CATV) AND RADIO DISTRIBUTION SYSTEMS (COAXIAL CABLE) (2)
	Tables – Conductor and Raceway Specifications	NEC (Annex C: Tables)	
	Final Exam Review	UNEC1 (Article 430) UNEC2 (Articles 550-590 & Chapters 6-9) BMC (Chapters 1-4)	REVIEW ALL PREVIOUS ASSIGNMENTS
	Final Exam	Standardized Exam Reviewing Weeks 13-24 Material Covered	CANVAS EXAM (3.5 HOURS TO COMPLETE – 1 ATTEMPT)